

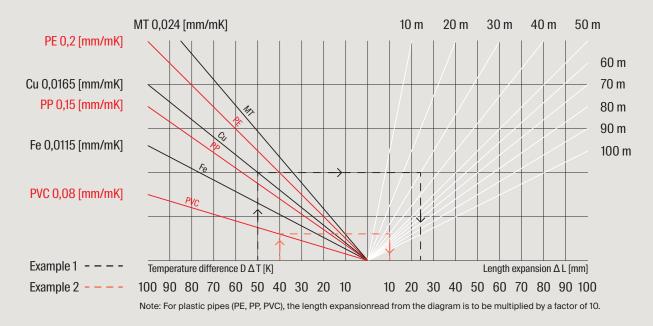
Fixed points and sliding elements.



Fixed points and sliding elements - for what purpose?

Elongation:

Materials expand with heat. For long components, the change in length is mainly considered. So it is not always a matter of expansion. Shrinkage upon cooling is to also be included in the calculation. This is important when installing pipes. Within piping, the change in length is to be specifically steered. Not doing this during installation results not only in pipe defects, but also in serious damage to components. It is therefore essential to determine how great the change in the length of a pipe can be. For this purpose, the pipe length and the expansion coefficient of the pipe material, as well as the expected temperature difference, must be known. This is to be determined such that not only the normal operating temperatures, but also the maximum temperatures that can arise in a case of malfunction, are taken into account. The range is therefore from around 10 °C assembly temperature up to 95°C service temperature for water filled systems.



Copper pipe, Cu – Length of pipe span 30 m Temperature difference $\Delta T = 50 \text{ K}$ Length expansion $\Delta L = 24,75 \text{ mm}$

PVC pipe – Length of pipe span L = 40 m Temperature difference Δ T = 40 K Length expansion Δ L = 128 mm (table value x 10) Length expansion calculation formula $\Delta L = L \times \Delta T \times \alpha$ [mm] [m] [K] [mm/m K]

Δ L=Change in length
L= Length of the pipe span/section

 Δ T = Temperature difference α = Length expansion coefficient

The fischer fixed points:

The fixed points with or without a sound insulation insert are suitable for fixings subject to thermal pipe expansions like in the case of heating pipes and refrigeration pipes. They can also be used to orient the expansion in the desired direction. The fixed points are either completely pre-mounted or modular in design. The galvanized zinc version is suitable for installation in buildings.

The fischer sliding elements:

The sliding elements for the absorption of thermal pipe expansions on heating pipes and refrigeration pipes enable the absorption of the expansion distance in both directions. The sliding elements are completely pre-mounted and can be secured with different anchors or screws and bolts. The galvanized zinc version is suitable for installation in buildings.

Applications



Heating pipes



Steam pipes



Media lines with thermal expansion



Cooling lines



Hot water and circulation pipes



Single line with thermal expansion

The light fixed points.

The light fixed points in compact and variable design prevent unwanted movements between pipes and structures in hot- or cold-running pipes and align the thermally induced pipe expansion in the desired direction. The compact fixed point FFP-C transfers the incoming forces directly into the structure. The variable fixed points FFP-L allow the adjustment of the suspension height and

are braced on one or both sides with threaded rods. The light fixed points are used in combination with the FFPC Fixed point solid clamp. The galvanized version is suitable for installations in buildings.

Your advantages at a glance

- The compact design of the compact fixed point FFP-C enables a small distance to the substrate and ensures safe transfer of the occurring forces into the substrate.
- The supports and braces on one or both sides of the variable fixed points allow adaptation to the distance of the pipeline to the subsoil.
- The fixed points consist of components with matching thread sizes and plug holes, thus ensuring easy assembly with the same tools.
- The height adjustment on the base plate allows for precise adjustment to match mounted pipelines and therefore ensures the safe function of the fixed points.



The compact design of the fixed point FFP-C enables a small distance to the substrate



FFP-C Fixed point compact
The compact fixed point solution for light loads*





^{*} The clamp and the threaded rods are not included in the set.

The medium-weight fixed points.

The medium-weight fixed points in compact and variable design prevent undesired movements between pipes and structures in hot- or cold-running pipelines and align the thermally induced pipe expansion in the desired direction. The fixed point saddle FFS-M reliably transfers the incoming forces directly into the structure and is height-adjustable. The variable fixed points FFP-M allow the

adjustment of the suspension height to suit the pipe position and are braced on one or both sides with threaded rods. The FFP-M and FFP-M2 can be fitted with the FFPC Fixed point solid clamp as well as the FFRC Refrigeration fixed point clamp. The galvanized version is suitable for installations in buildings.

Your advantages at a glance

- The fixed points consist of components with matching thread sizes and plug holes, thus ensuring easy assembly with the same tools.
- The height adjustment of the fixed point allows for precise adjustment to match mounted pipelines and therefore ensures the safe function of the fixed points.
- The fixed point saddles and the FFP-M and FFP-M2 are suitable for mounting the FFPC Fixed point solid clamp and FFRC Refrigeration fixed point clamp for even more flexibility.
- The axially and laterally adjustable bracing angles of the FFP-M22, FFP-M42, FFP-MD2 and FFP-MD4 allow the subsoil connection to be adapted to the conditions on site and simplify the installation.



The medium fixed points FFP-M and FFP-M2 and the medium fixed point saddles FFS-M and FFS-M2 can be used with the FFPC Fixed point solid clamp as well as the FFRC Refrigeration fixed point clamp.



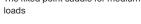


*The clamp and the threaded rods are not included in the set.





The fixed point saddle for medium



The heavy fixed points.

The heavy fixed points in compact and variable design prevent undesired movements between pipes and structures in hot- or cold-running pipelines and align the thermally induced pipe expansion in the desired direction. The compact fixed points FFS-H reliably transfer the incoming forces directly into the structure and are height-adjustable. The variable fixed points

FFP-H allow the adjustment of the suspension height to suit the pipe position and are braced on one or both sides with threaded rods. The FFP-HD22 and FFP-HD42 can be fitted with the FFPC Fixed point solid clamp as well as the FFRC Refrigeration fixed point clamp. The galvanized version is suitable for installations in buildings.

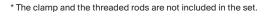
Your advantages at a glance

- The fixed points consist of components with matching thread sizes and plug holes, thus ensuring easy assembly with the same tools.
- The height adjustment of the fixed point allows for precise adjustment to match mounted pipelines and therefore ensures the safe function of the fixed points.
- The fixed points are suitable for mounting the FFPC Fixed point solid clamp and FFRC Refrigeration fixed point clamp for even more flexibility.
- The axially and laterally adjustable bracing angles of the FFP-HD22 and FFP-HD42 allow the subsoil connection to be adapted to the conditions on site and simplify the installation.



The heavy fixed points FFP-HD22 and FFP-HD42 and the heavy fixed point saddles FFS-H and FFS-H2 can be used with the FFPC Fixed point solid clamp as well as the FFRC Refrigeration fixed point clamp.







The fixed point saddle for heavy

The refrigeration fixed point clamp FFRC.

The fischer Refrigeration fixed point clamp FFRC with PUR rigid foam insulation and metal core is suitable for fixing pipes to structures. The Refrigeration fixed point clamp FFRC can be mounted on the fixed point saddles FFS-M or FFS-H as well as

on the braced fixed points FFP. The galvanized steel version is suitable for installations in buildings.

Your advantages at a glance

- The FFRC Refrigeration clamp made of closed PUR foam can be used with all common insulation materials.
- The design of the FFRC Refrigeration clamp with external screw holes and internal welding ring enables the support of high loads.
- The age-resistant material ensures consistent function of the FFRC.
- The included connecting plates with matching connection holes and threads reduce the assembly effort by providing an optimal fit.
- The FFRC Refrigeration fixed point clamp can be mounted on the fixed point saddles FFS-M or FFS-H as well as on the braced fixed points FFP.





FFRC 168 FFRC 273

Comparison of FFP-M and FFP-HD as cold fixed point with FFRC refrigeration fixed point clamp:

	FFP-M and FFP M2	FFP-HD22 and FFP-HD42
Criteria		
Max. Pipe diameter	193,7 mm	355,6 mm (601 mm ²⁾)
Max. recommended axial load ¹⁾	4,0 / 8,0 kN	18,0 / 30,0 kN
Max. Construction height	1500 mm	2000 mm
Fixing FFRC refrigeration fixed point clamp	Central, through included connecting plate with threaded nut	At the side, through the central holes in the supplied connecting plates
Recommended installation	Before or during laying the pipes	Before, during or after laying the pipes
Connection of the supports and braces	Central above the pipeline	At the side next to the pipeline

 $^{^{\}rm 1)}$ Note the max. loads of the FFRC refrigeration fixed point clamp and other instructions.

²⁾Clamp sizes from 355.6 mm to 601 mm are available on request.

The compact and light sliding elements.

The FASC Axial Slider is used for absorbing pipe expansions and is recommended for light pipes up to DN50. The FASC has a maximum sliding range of 40 mm and a maximum load capacity of 0.7 kN. fischer offers the FASC with a metric combination thread M8/

M10. The FASC can be used for upright or suspended mounting. The galvanized version is suitable for installations in buildings.



FASC M8/10

The compact axial slider with combination connecting thread

The FASL Axial Slider is used for absorbing pipe expansions and is recommended for light pipes up to DN100. The FASL has a maximum sliding range of 100 mm / 120 mm and a maximum load capacity of 1,5 kN. fischer offers the FASL with a metric combina-

tion thread M8/M10 and with a single thread M10. The FASL can be used for upright or suspended mounting. The galvanized version is suitable for installations in buildings.



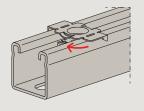
FASI 2 M10

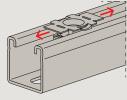
The light axial slider with single or double mount and single or combination connection thread

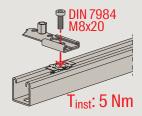
Your advantages at a glance

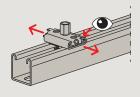
- The sliders can be used flexibly, thanks to the application options as a standing or hanging slider.
- The low sliding friction of the plastic sliding pad enables optimum force application at the fixed point.
- The base plate of the sliders is compatible with the FLS and FUS channel systems and allows fixing with one or two screws.
- The large sliding path and the long slide rails of the FASL allow large expansions to be accommodated without any problems.
- The flexible combination thread allows the use of pipe clamps of various sizes.

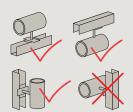
Installation FASC M8/10











The medium sliding elements.

The FASM Axial Slider is used for absorbing pipe expansions and is recommended for medium pipes up to DN150. The FASM has a maximum sliding range of 100 mm / 150 mm and a maximum load capacity of 3,0 kN. fischer offers the FASM with a metric combination thread M10/M12. The FASM can be used for upright or

suspended mounting. The galvanized version is suitable for installations in buildings. The Axial Slider FASM2 guarantees an additional plus in safety thanks to the fire protection certificate.



FASM1 M10/12

The medium axial slider with single mount and combination connection thread



FASM2 M10/12

The medium axial slider with double mount and combination connection thread

Your advantages at a glance

- The fire test report according to MLAR R30 up to a maximum of R120 guarantees objectively tested safety of function
- The FASM can be used flexibly, thanks to the application options as a standing or hanging slider and as a guide bearing on vertical pipelines.
- The low sliding friction of the plastic sliding rails enables optimum force application at the fixed point.
- The large sliding path and the long slide rails allow large expansions to be accommodated without any problems.
- The base plate of the FASM is compatible with the FUS and FMS channel systems and allows fixing with one or two screws
- A cross-slide function of the FASM is possible with the FCSM cross slider as well as with the FASL2 M10.

Certificates

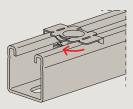


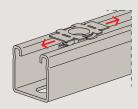


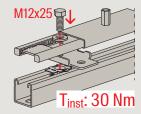
Fire resistance classification

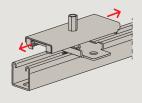
R30 MLAR

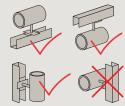
Installation FASM1 M10/12 (central fixing)











The heavy sliding elements.

The FASH Axial Roller Slider is used for absorbing pipe expansions and is recommended for heavy pipes up to DN350. The FASM has a maximum sliding range of 140 mm and a maximum load capacity of 10,0 kN. fischer offers the FASH with a metric combination thread M12/M16. The FASL can be used for upright or suspended

mounting. The galvanized version is suitable for installations in buildings. The Axial Slider FASH2 guarantees an additional plus in safety thanks to the fire protection certificate.



FASH1 M12/16

The heavy axial roller slider with single mount and combination connection thread



FASH2 M12/16

The heavy axial roller slider with double mount and combination connection thread

Your advantages at a glance

- The fire test report according to MLAR R30 up to a maximum of R120 guarantees objectively tested safety of function.
- The FASH can be used flexibly, thanks to the application options as a standing or hanging slider and as a guide bearing on vertical pipelines.
- The low sliding friction of the two sliding rollers enables optimum force application at the fixed point.
- The large sliding path and thetwo sliding rollers allow large expansions to be accommodated without any problems.
- The base plate of the FASH is compatible with the FUS and FMS channel systems and allows fixing with one or two screws.
- A cross-slide function of the FASH1 or FASH2 is possible with the FCSM cross slider as well as with the FASH2.

Certificates

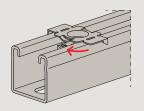


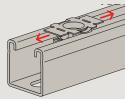


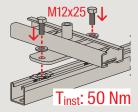
Fire resistance classification R120

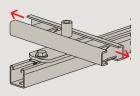
MLAR

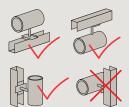
Installation FASH1 M12/16



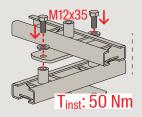


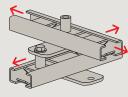


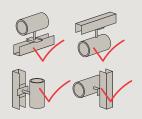




Cross-slide function via double mounting with the FASH2 M12/16







The cross slider FCSM.

The FCSM Cross Slider is used for absorbing pipe expansions and is recommended for light to heavy pipes up to DN350. The channel slider can be inserted at any position in the FUS mounting channels. The maximum load capacity per slider is 5.0 kN, always using two FCSM in the application as a lateral slider. fischer offers

the FCSM with a metric M12 thread to match the axial sliders. The FCSM is intended for upright installations. The hot-dip galvanized steel version is suitable for installations in- and outdoors.



FCSM M12
The channel slider for all load levels

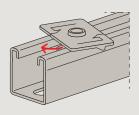
Your advantages at a glance

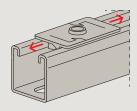
- The simple connection of the FCSM Cross Slider with the FUS mounting channels by simply inserting and rotating by 45° also allows subsequent installation at any position.
- Due to the application as a upright slider in the FUS mounting channels, the FCSM is the universal cross slider substructure for all axial and roller sliders.
- The unique design and use as a single or double glider allows for high load carrying capacity.
- The low sliding friction of the plastic sliding surface minimizes resistance during lateral expansion.

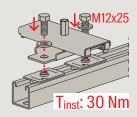


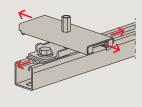
Axial-lateral slider with FCSM M12 in FUS mounting channel

Installation FCSM















Assortment

Fixed points light











P-C FFP-

	Item No.	Matching clamp	Max. recommended axial load	Sales unit
Item			F _{x rec.} [kN]	[pcs]
FFP-C Fixed point compact	567696	FFPC to 60,3 mm	5,0	1
FFP-L Fixed point light	567697	FFPC to 139,7 mm	3,0	1
FFP-L2 Fixed point light	567698	FFPC to 139,7 mm	7,0	1
FFP-L22 Fixed point light	567699	FFPC to 193,7 mm	4,0	1
FFP-L42 Fixed point light	567700	FFPC to 193,7 mm	7,0	1

Fixed points medium









FFP-M

FFP-M2

FFP-M22

FFP-M42

	Item No.	Matching clamp	Max. recommended axial load	Sales unit
Item			F _{x rec.} [kN]	[pcs]
FFP-M Fixed point medium	567701	FFPC to 193,7 mm FFRC to 168,3 mm	4,0	1
FFP-M2 Fixed point medium	567702	FFPC to 193,7 mm FFRC to 168,3 mm	8,0	1
FFP-M22 Fixed point medium	567703	FFPC to 193,7 mm	7,0	1
FFP-M42 Fixed point medium	567704	FFPC to 193,7mm	14,0	1

Fixed points medium





FFP-MD2 V1/V2

FFP-MD4 V1/V2

	Item No.	Matching clamp	Max. recommended axial load	Sales unit
Item			F _{x rec.} [kN]	[pcs]
FFP-MD2-V1 Fixed point medium	567706	FFPC to 193,7 mm	12,0	1
FFP-MD2-V2 Fixed point medium	567707	FFPC from 219,1 mm	12,0	1
FFP-MD4-V1 Fixed point medium	567709	FFPC to 193,7 mm	18,0	1
FFP-MD4-V2 Fixed point medium	567710	FFPC from 219,1 mm	18,0	1

Fixed points heavy









FFP-HD22

FFP-HD22 V1/V2

FFP-HD42

FFP-HD42 V1/V2

111 11022 111 11	111 110 12	111 110 12 11/12		
	Item No.	Matching clamp	Max. recommended axial load	Sales unit
Item			F _{x rec.} [kN]	[pcs]
FFP-HD22 Fixed point heavy	567711	FFRC from 193,7 mm	18,0	1
FFP-HD22-V1 Fixed point heavy	567712	FFPC to 193,7 mm	18,0	1
FFP-HD22-V2 Fixed point heavy	567713	FFPC from 219,1 mm	18,0	1
FFP-HD42 Fixed point heavy	567714	FFRC from 193,7mm	30,0	1
FFP-HD42-V1 Fixed point heavy	567715	FFPC to 193,7 mm	30,0	1
FFP-HD42-V2 Fixed point heavy	567716	FFPC from 219,1 mm	30,0	1

Fixed point saddles medium and heavy









	Item No.	Matching clamp	Max. recommended axial load	Sales unit
Item			F _{x rec.} [kN]	[pcs]

			r _{x rec.}	[pcs]
Item				
FFS-M Fixed point saddle medium	569306	FFPC, FFRC to 168,3 mm	9,0	2
FFS-M2 Fixed point saddle medium	569307	FFPC, FFRC to 168,3 mm	23,0	1
FFS-H Fixed point saddle heavy	569308	FFPC, FFRC from 168,3 mm	14,0	2
FFS-H2 Fixed point saddle heavy	569309	FFPC, FFRC from 168,3 mm	36,0	1

Assortment

Fixed point solid clamp



FFP(

	Item No.	Max. recom. static load (centr. tension)	Sales unit
		F _{z rec.}	
		zrec. [kN]	
Item			[pcs]
Fixed point solid clamp FFPC 21	567717	10,15	2
Fixed point solid clamp FFPC 27	567718	10,15	2
Fixed point solid clamp FFPC 28	567719	10,15	2
Fixed point solid clamp FFPC 31	567720	10,15	2
Fixed point solid clamp FFPC 34	567721	10,15	2
Fixed point solid clamp FFPC 40	567722	10,15	2
Fixed point solid clamp FFPC 43	567723	10,15	2
Fixed point solid clamp FFPC 49	567724	10,15	2
Fixed point solid clamp FFPC 50	567725	10,15	2
Fixed point solid clamp FFPC 61	567726	10,15	2
Fixed point solid clamp FFPC 63	567727	17,6	2
Fixed point solid clamp FFPC 70	567728	17,6	2
Fixed point solid clamp FFPC 76,1	567729	17,6	2
Fixed point solid clamp FFPC 88,9	567730	17,6	2
Fixed point solid clamp FFPC 108	567731	17,6	2
Fixed point solid clamp FFPC 114,3	567732	17,6	2
Fixed point solid clamp FFPC 133	567733	17,6	2
Fixed point solid clamp FFPC 139,7	567734	17,6	2
Fixed point solid clamp FFPC 159	567735	17,6	2
Fixed point solid clamp FFPC 168,3	567736	17,6	2
Fixed point solid clamp FFPC 193,7	567737	17,6	2
Fixed point solid clamp FFPC 219,1	567738	22,3	2
Fixed point solid clamp FFPC 267	567739	22,3	2
Fixed point solid clamp FFPC 273	567740	22,3	2
Fixed point solid clamp FFPC 323,9	567741	22,3	2
Fixed point solid clamp FFPC 355,6	567742	22,3	2

Refrigeration fixed point clamp





FFRC to 168,3

FFRC from 193,7

	Item No.	Max. recom. static load (centr. tension)	Sales unit
tem		F _{z rec.} [kN]	[pcs]
Refrigeration fixed point clamp FFRC 76.1	567747	3,6	1
Refrigeration fixed point clamp FFRC 88,9	567748	4,3	1
Refrigeration fixed point clamp FFRC 108	567749	6,5	1
Refrigeration fixed point clamp FFRC 114,3	567750	6,9	1
Refrigeration fixed point clamp FFRC 133	567751	7,7	1
Refrigeration fixed point clamp FFRC 139,7	567752	8,1	1
Refrigeration fixed point clamp FFRC 159	567753	9,2	1
Refrigeration fixed point clamp FFRC 168,3	567754	9,7	1
Refrigeration fixed point clamp FFRC 193,7	567755	23	1
Refrigeration fixed point clamp FFRC 219,1	567756	23	1
Refrigeration fixed point clamp FFRC 273	567757	28	1
Refrigeration fixed point clamp FFRC 323,9	567758	32,8	1
Refrigeration fixed point clamp FFRC 355,6	567759	36	1
Refrigeration fixed point clamp FFRC 368	567760	46,3	1
Refrigeration fixed point clamp FFRC 406,4	567761	50,4	1
Refrigeration fixed point clamp FFRC 457	567762	57,1	1
Refrigeration fixed point clamp FFRC 508	567763	62,4	1
Refrigeration fixed point clamp FFRC 601	567764	89,2	1

Assortment

Axial Slider compact and light









FASC M8/10

FASL1 M8/10

FASL2 M8/10

FASL2 M10

	Item No.	Max. recommended static load (suspended)	Max. recommended static load (upright)	Sales unit
		N _{rec.}	N _{rec.}	
Item		[kN]	[kN]	[pcs]
FASC M8/10 Axial Slider compact	567948	0,7	0,7	50
FASL1 M8/10 Axial Slider light	567949	1,2	1,2	10
FASL2 M8/10 Axial Slider light	568670	1,5	1,5	10
FASL2 M10 Axial Slider light	567950	1,5	1,5	10

Axial Slider medium





FASM1 M10/12

FASM2 M10/12

TAGINI WIGHT				
	Item No.	Max. recommended static load (suspended)	Max. recommended static load (upright)	Sales unit
		N _{rec.}	N rec.	
Item		[kN]	[kN]	[pcs]
FASM1 M10/12 Axial Slider medium	567951	2,5	2,5	10
FASM2 M10/12 Axial Slider medium	567952	3	3	10

Axial Roller Slider heavy





FASH1 M12/16

FASH2 M12/16

	Item No.	Max. recommended static load (suspended)	Max. recommended static load (upright)	Sales unit
		N _{rec.}	N _{rec.}	
		[kN]	[kN]	
Item				[pcs]
FASH1 M12/16 Axial Roller Slider heavy	567953	6,5	6,5	5
FASH2 M12/16 Axial Roller Slider heavy	567954	10	10	5

Cross Slider



FCSM M12

	Item No.	Max. recommended static load (upright)	Sales unit
		N _{rec.}	
Item		[kN]	[pcs]
FCSM M12 Cross Slider medium	567955	5	50





Safe and reliable.

The fischer design Software FiXperience gives you safe and reliable support in dimensioning your projects whether you are a planer, structural engineer or craftsman. FiXperience is set up modularly

and useable for a variety of applications. The program includes an engineering software with special application modules:



C-FIX

FiXperience

The anchor design program for steel and bonded anchor in concrete, as well as injection systems for masonry. Now with the new FEM design tool for the realistic design of anchorages.



MORTAR-FIX

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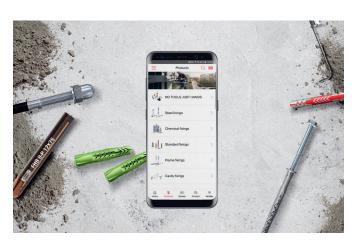
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